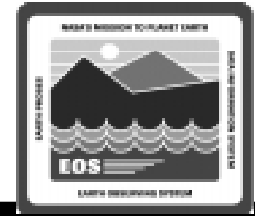


PROBLEM MANAGEMENT

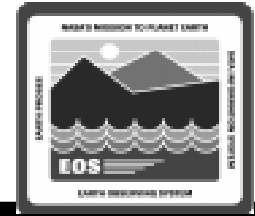
ECS Release 4 Training

Overview of Lesson



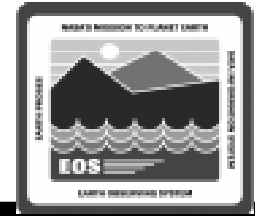
- **Introduction**
- **Writing a Trouble Ticket (TT)**
- **Documenting Changes**
- **Problem Resolution**
- **Preparing a TT Telecon and Processing a TT through the Failure Review Board**
- **Making Emergency Fixes**
 - **Help Desk Triage Team**
- **Practical Exercises**
 - **Writing a Trouble Ticket**
 - **Documenting TT Changes**

Objectives



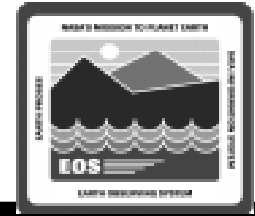
- **OVERALL:**
 - Develop proficiency in trouble ticketing and problem resolution procedures
- **SPECIFIC:**
 - Submit a trouble ticket (TT)
 - Make changes to an existing TT
 - Describe the steps in the routine problem resolution process
 - Describe the steps in preparing a TT Telecon and processing a TT through the Failure Review Board
 - Describe the process of making emergency fixes
- **STANDARD:**
 - Mission Operation Procedures for the ECS Project - 611-CD-004-004

Importance



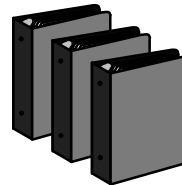
- All internal users of ECS are affected
- If a problem occurs with ECS hardware, software, documentation, or procedures, it is necessary to apply problem management tools and procedures

Writing a Trouble Ticket (TT)

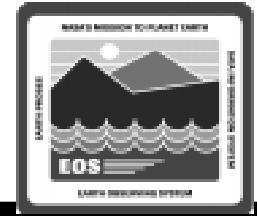


- **Electronic document for:**
 - Reporting/recording problems
 - Recording an idea for a system enhancement
- **Problems affect the following ECS components:**

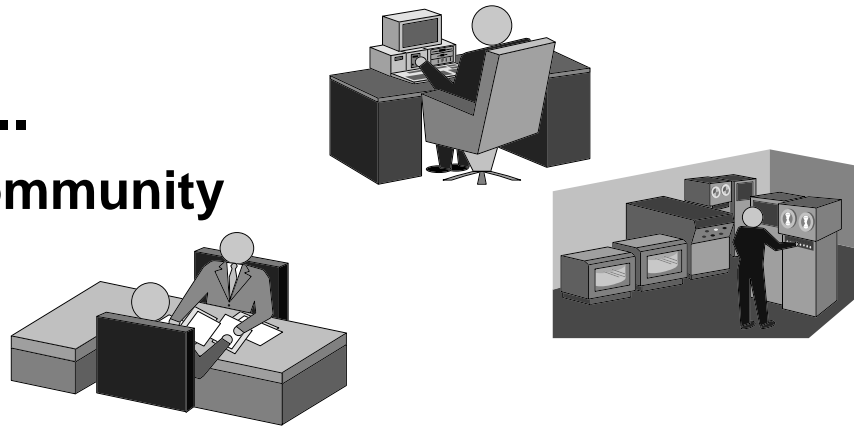
- hardware
- software
- technical documents
- procedures



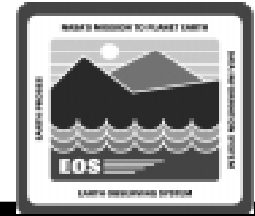
Writing a Trouble Ticket (Cont.)



- **TTs are submitted by...**
 - users in the science community
 - ECS operators/staff
 - ECS developers
- **Trouble Ticket states:**
 - open
 - closed

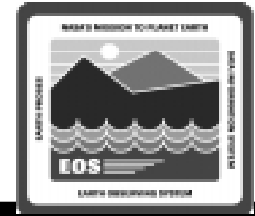


Writing a Trouble Ticket (Cont.)



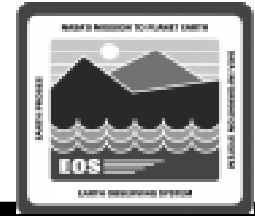
- **If a configuration change is required, a Configuration Change Request (CCR) is prepared.**
 - provides documentation for the configuration management process
 - a TT leads to a CCR only when a configuration change is proposed

Writing a Trouble Ticket (Cont.)



- **ECS Trouble Ticketing System provides a consistent means of...**
 - reporting ECS problems
 - classifying problems
 - tracking the occurrence and resolution of problems

Writing a Trouble Ticket (Cont.)

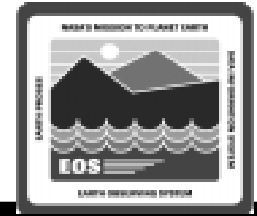


- **Trouble Ticketing System**
 - managed by Remedy's Action Request System
 - provides Graphical User Interface (GUI)
 - provides a common entry format
 - stores TTs
 - retrieves TTs
 - transfers TTs between facilities
 - produces reports
 - provides e-mail interface (automatic notification)
 - provides application programming interface
 - provides summary information to SMC
 - defines TT "life cycle"
 - allows customized escalation and action rules

Writing a Trouble Ticket (Cont.)

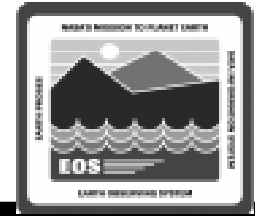
- **Trouble Ticketing System - methods of submitting TTs or checking TT status:**
 - **Remedy (Action Request System)**
 - **custom hypertext markup language (HTML) documents**
 - **text e-mail template**
 - **contacting a User Services representative at one of the DAACs**
 - **by telephone**
 - **in person**

Writing a Trouble Ticket (Cont.)



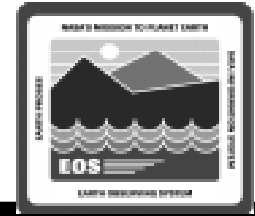
- **User Services - Contact Log**
 - separate Remedy schema (GUI) for recording user contacts
 - clicking a button transfers data from the contact log to the appropriate fields on a trouble ticket form

Writing a Trouble Ticket (Cont.)



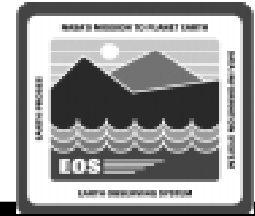
- **Writing/Submitting Trouble Tickets**
 - **external users**
 - HTML documents
 - e-mail template
 - contacting User Services
 - **internal operators and users**
 - Remedy Action Request System

Writing a Trouble Ticket (Cont.)



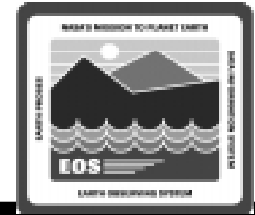
- **TTs are handled electronically**
 - common distributed-access database system
 - Remedy is the database tool
- **Supporting documentation must be handled separately**
 - not possible to attach a file in Remedy
 - via e-mail to the TT database administrator
 - sending/giving it to the TT database administrator
 - SMC Configuration Management (CM) Administrator
 - SEO Operations Readiness and Performance Assurance Analyst
 - DAAC Operations Readiness and Performance Assurance Analyst

Writing a Trouble Ticket (Cont.): Procedure



- **Access Remedy User Tool**
 - Follow procedure to access Remedy
- **Log in if first-time user**
- **Select RelB-Trouble Tickets Schema**
 - File menu
 - Open Schema
- **Select Open Submit**
 - File menu

Writing a Trouble Ticket (Cont.): Release B Trouble Tickets Schema



Action Request System — RelB-Trouble Tickets (g0msh08)

File Edit Query Actions Monitor Window Help

Ticket-id: [] Ticket Status: [Clear] Assigned-Priority: [Clear]

Short Description: [] Submitter Impact: [Clear]

Long-Description: [] Detailed Resolution Log: []

Resolution Log (End User Sees): []

Submitter ID: [] Assigned-To: [] Closing Code: []

Submitter Name: [] Last-modified-by: [] Created-by: []

Submitter Phone: [] Create-date: [] Date-date: []

Submitter eMail: [] Last-enabled-date: [] Software Resource: []

Submitter Home DWAC: [] Related CCR: [] Hardware Resource: []

History: [] Key Words: [] Hardware Information: []

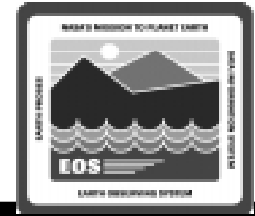
CI: [] Problem Type: []

List All Masters

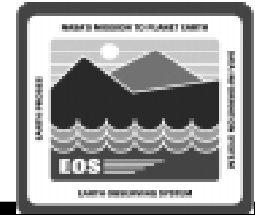
< > + - * / % = < > < > LIKE AND OR NOT Fields: []

Query: []

Writing a Trouble Ticket (Cont.): “Open Schema” Window

A screenshot of a software window titled "Open Schema". The window has a standard Mac OS-style title bar with a close button. Below the title bar, the text "Available Schemas" is displayed. Underneath, there is a list of four schemas: "RelB-Contact Log (g0msh08)", "RelB-TT-ForwardToSite (g0msh08)", "RelB-Trouble Tickets (g0msh08)", and "Trouble-Ticket-Xfer (g0msh08)". Below the list, a note states "* indicates a server that is not reachable". Under the note, the word "Selection" is followed by a text input field containing the letter "I". At the bottom of the window, there are two buttons: "Apply" and "Dismiss".

Writing a Trouble Ticket (Cont.): Trouble Ticket “Submit” Window



Submit — RelB-Trouble Tickets (g0msh08)

Ticket ID: Ticket Status: Assigned Priority:

Short Description: Submitter Impact:

Long Description: Detailed Resolution Log:

Resolution Log (End User Seen):

Submitter ID: Assigned To: Closing Code:

Submitter Name: Last Modified By:

Submitter Phone: Create Date:

Submitter Email: Last Modified Date:

Submitter Home DAAC: Software Resource:

History: Related CCR: Hardware Resource:

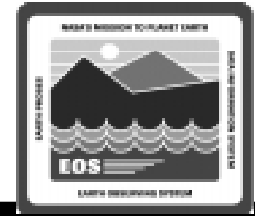
CI: Key Words: Hardware Information:

Problem Type:

List All Masters
List This TT's Duplicate(s)

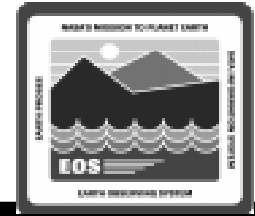
Apply Clear Set to Defaults Done

Writing a Trouble Ticket (Cont.): Procedure



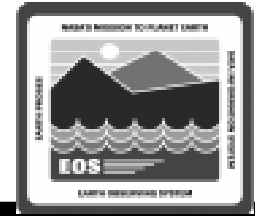
- **Type a short description of the problem**
 - Short Description field
- **Fill in Submitter ID**
 - Submitter ID field
 - Use pick-list
- **Select Submitter Impact**
 - High, Medium or Low
 - Optional
 - Low is default

Writing a Trouble Ticket (Cont.)



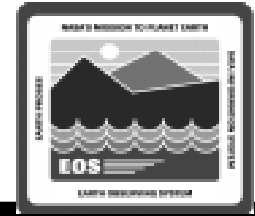
- **Fill in optional data:**
 - Long Description
 - Software Resource
 - Hardware Resource
- **Verify data**
- **Submit the TT**
 - click on the Apply button
 - confirmation message appears at bottom of window
 - Remedy also sends confirmation by e-mail

Writing a Trouble Ticket (Cont.)



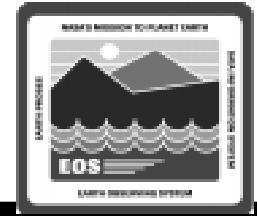
- **Exit from the Remedy Action Request System**
 - Dismiss button
 - File menu
- **Send backup information/documentation to the TT database administrator**
 - send e-mail cover message
 - identify TT number
 - provide Submitter ID
 - include relevant information concerning attachments

Documenting Changes



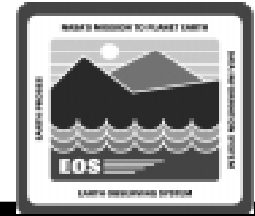
- **Trouble tickets are modified at various stages of problem resolution, for example:**
 - assignment to a technician for problem resolution
 - resolution log entries
 - changes of status
 - forwarding to another site
- **Access privileges**
 - controlled by the database administrator
 - determine which TT fields an operator/user may modify

Documenting Changes (Cont.): Reviewing and Modifying Open TTs



- **Access Remedy User Tool**
 - Follow procedure to access Remedy
- **Select RelB-Trouble Tickets Schema**
 - File menu
 - Open Schema
- **List TTs**
 - Query menu

Documenting Changes (Cont.): Trouble Ticket “Query List” Window



Query List --- RelB-Trouble Tickets (g0msh08)

Query Actions

Matching entries:

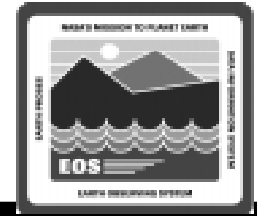
GSF0000000000003 ECS Problem for Training

Number of matching entries : 1 (11/13/97 15:25:26)

Poll ☒ Off ☐ On 10 Minutes

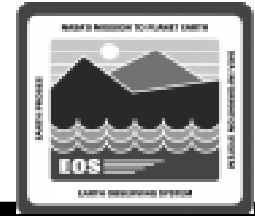
Refresh Dismiss

Documenting Changes (Cont.): Reviewing and Modifying Open TTs



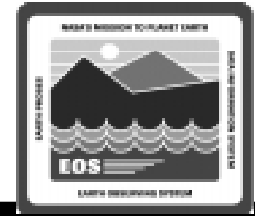
- **Highlight/select the TT to be reviewed/modified**
- **Select Modify Individual**
 - Query menu
- **Review/Modify TT fields**
- **If forwarding the TT:**
 - set Ticket Status at Forwarded
 - select (from pick-list) the center to receive the TT
 - click on the Forward button

Documenting Changes (Cont.): Reviewing and Modifying Open TTs



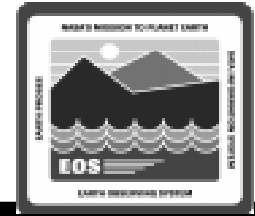
- **Apply changes**
 - click on the Apply button
- **Exit from the Remedy Action Request System**
 - Dismiss button
 - File menu

Problem Resolution



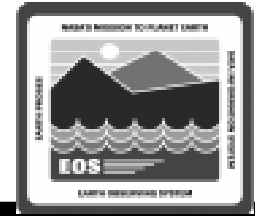
- **Overview of Problem Resolution**
 - Every trouble ticket (TT) is logged into the Remedy database for record-keeping purposes
 - Each TT is evaluated first at the local center
 - determine the severity of the problem
 - assign on-site responsibility for investigating the problem
 - TTs that can be resolved locally are assigned and tracked at the local center

Problem Resolution (Cont.)



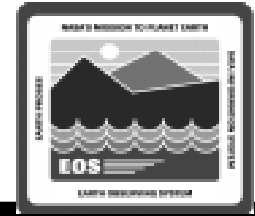
- **Overview of Problem Resolution (Cont.)**
 - **Matters of sufficient importance are escalated to the agenda of the trouble ticket teleconference (“TT Telecon”)**
 - **sponsored by the Sustaining Engineering Organization (SEO)**
 - **held weekly**
 - **functions as the ECS Failure/Malfunction Review Board (FRB)**
 - **participants discuss high-priority TTs and coordinate TT activities within the Maintenance and Operations (M&O) organization as well as with development, customer, and user organizations**

Problem Resolution (Cont.)



- **Operations Supervisor reviews TTs and assigns priorities by triage**
- **Triage system of maintenance priorities**
 - **system for assessing adverse effects on mission success on the basis of the following factors:**
 - **scope of the problem's effects (impact)**
 - **frequency of occurrence**
 - **availability of an adequate work-around**

Problem Resolution (Cont.)

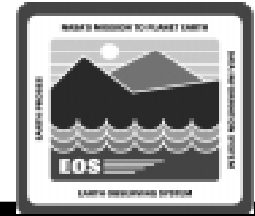


- **Classification of Problems**
 - **Performance Assurance Categories**
 - 1: system/service cannot perform critical function or imposes major safety hazard (“Red Flag”)
 - 2: system/service substantially impaired
 - 3: system/service slightly impaired
 - **SEO Priorities**
 - 4: nuisance problem
 - 5: closed problem

Problem Resolution (Cont.)

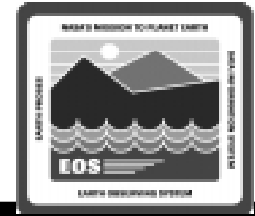
- **Red Flag reports (Category-1)**
 - malfunctions “involving the command and control functions of the FOS or those that can result in inability to produce, or irretrievable loss of Essential Data Products”
(Performance Assurance Requirements)

Problem Resolution (Cont.)



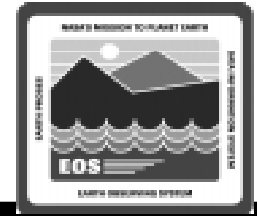
- **Remedy priority codes**
 - high
 - medium
 - low
- **Priorities are assigned by the Operations Supervisor**
 - using the triage system
- **Priorities are maintained by the Configuration Management (CM) Administrator**

Problem Resolution (Cont.)



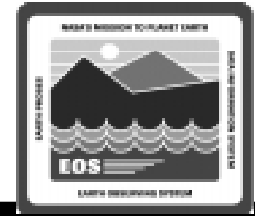
- **Category-1 problems receive a high priority rating**
 - are escalated to the attention of the FRB
 - require both Government and Contractor Project Manager approval for final close-out
- **Category-2 problems are assigned a medium priority rating**
 - resolved by the local Trouble Ticket Review Board (TTRB)
 - resolution is sent to the attention of the FRB for “advice and acknowledgment”

Problem Resolution (Cont.)



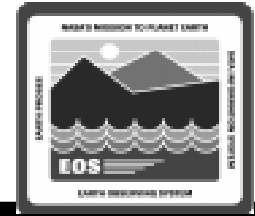
- **Remaining types of problems are assigned TT priorities at the discretion of the Operations Supervisor**
- **Medium- and low-priority trouble tickets can often be handled locally**
 - unless they affect more than one site
- **Problems that affect multiple sites are forwarded to the System Monitoring and Coordination Center (SMC)**

Problem Resolution (Cont.)



- **TT Review Board (local)**
 - may suggest, comment, reject, approve or recommend other actions
 - generates a CCR if the problem involves a configuration change
 - problem is entered into the Change Request Manager and directed through the configuration management process
 - issues implementing instructions if a local problem involves no configuration change
 - orders the closure of problems that have been corrected and whose fixes have been verified

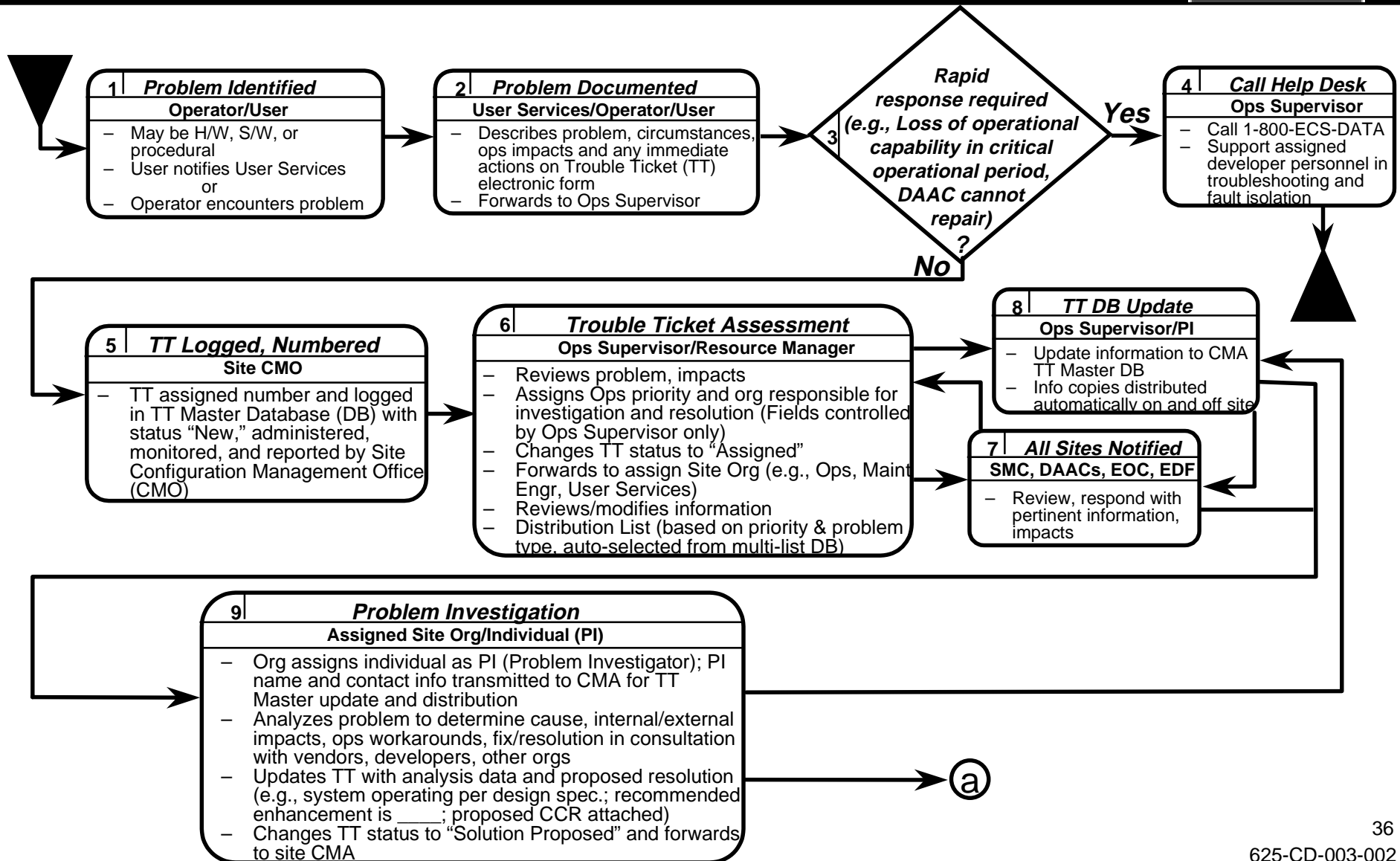
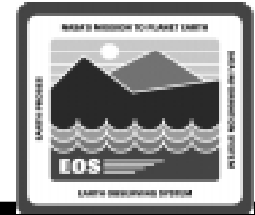
Problem Resolution (Cont.)



- **Failure/Malfunction Review Board (FRB)**
 - meets via “TT Telecon”
 - reviews high-priority TTs (Category 1)
 - acknowledges TTRB response to Category 2 problems
 - coordinates TT activities within M&O and with development, customer and user organizations

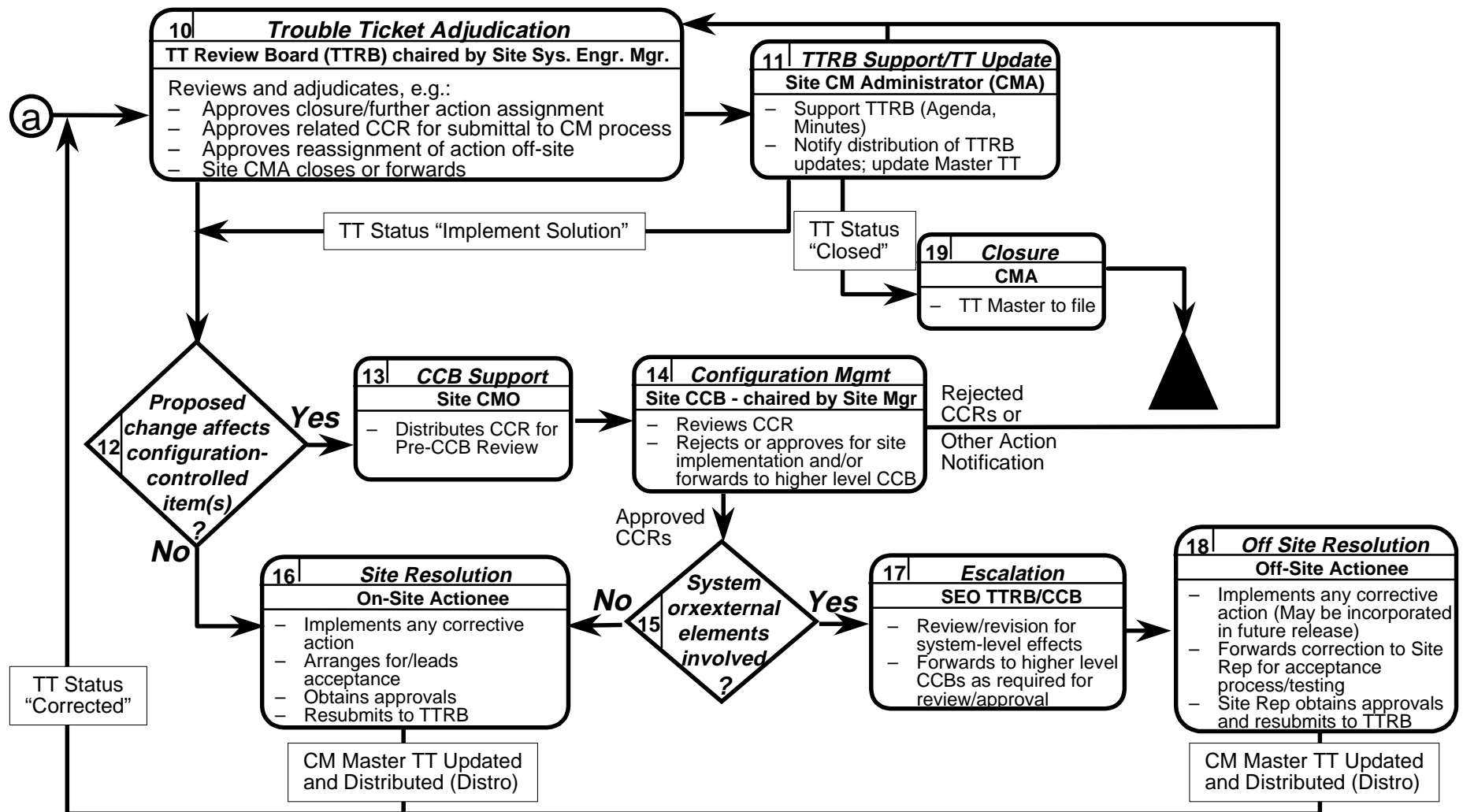
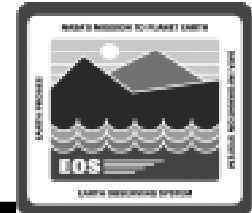
Problem Resolution (Cont.)

Problem Management Concept Pt. I

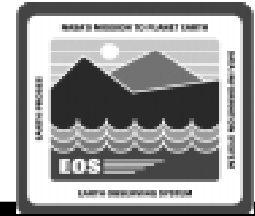


Problem Resolution (Cont.)

Problem Management Concept Pt. II

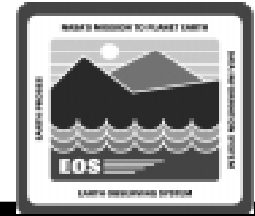


Problem Resolution (Cont.): Process



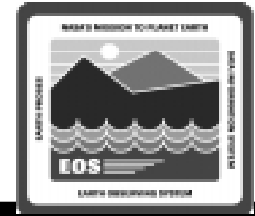
- **User/operator discovers problem (Step 1)**
- **User/operator or User Services submits a TT (Step 2)**
- **Operations supervisor decides whether or not a rapid response is required (Step 3)**
- **If rapid response is required, Operations Supervisor calls 1-800-ECS DATA (Step 4)**
- **Otherwise, Remedy logs TT into system and assigns status (“New”) to initiate administration and monitoring by the Site Configuration Management Office (CMO) (Step 5)**

Problem Resolution (Cont.): Process



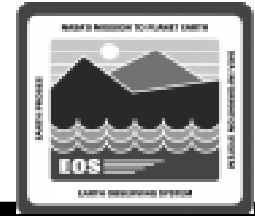
- **Operations Supervisor reviews TT, assigns priority, assigns problem to Problem Investigator (PI), and changes TT status to “Assigned” (Step 6)**
- **CM Administrator notifies affected centers (if any) (Step 7)**
 - **may forward TT to other center(s)**
 - **may send e-mail message with information**
- **TT database administrator updates database with inputs (Step 8)**

Problem Resolution (Cont.): Process



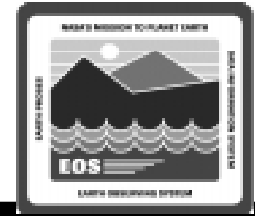
- **PI coordinates inputs from various sources; presents significant issues (if any) at TT Telecon; updates TT database after finding a prproposed solution to the problem; changes TT status to “Solution Proposed” (Step 9)**
- **TT Review Board (TTRB) considers problem; approves, rejects or revises proposed solution; TTRB is supported by the site CM Administrator (CMA) (Steps 10 & 11)**
- **TTRB decides whether proposed change affects a configuration controlled item and therefore needs to be referred to the CCB(s) (Step 12)**

Problem Resolution (Cont.): Process



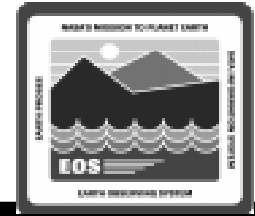
- For a configuration issue, site CMO distributes CCR for pre-CCB review (Step 13)
- Site CCB may approve, reject or revise change proposals (CCRs) (Step 14)
 - TTRB is notified of any rejected CCR and reconsiders the TT accordingly
- Site CCB decides whether system-wide or external elements are involved, necessitating referral to higher level CCB (Step 15)
- If proposed change does not affect a configuration controlled item, or if a site-approved CCR is not referred to higher level CCBs, solution may be implemented at site; TT status is changed to “Corrected” (Step 16)

Problem Resolution (Cont.): Process



- If external elements are involved and/or a CCR is escalated, off-site problem resolution process is managed by the SEO TTRB (Step 17)
 - may revise a proposed solution if there are system-level effects
- Off-site resolution may include corrective action incorporated in a future release; correction is forwarded to site representative for testing/acceptance; TT status is changed to “Corrected” (Step 18)
- TTRB approves closure/further action assignment; TT status is changed to “Closed” and CMA files TT Master (Step 19)

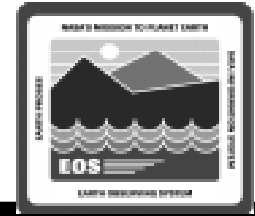
Problem Resolution (Cont.)



- **Trouble ticket and problem tracking scenario**
 - registered science end-user submits a Trouble Ticket
 - routine (non-emergency) problem
- **Problem scenario tracked through Trouble Ticket Review Board**

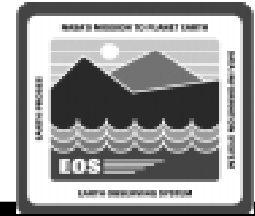
- _____

TT Telecon and FRB (Cont.): TT Telecon/FRB Attendees



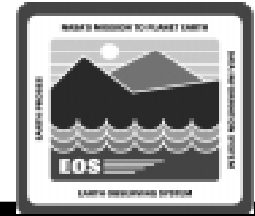
- **Customer representatives**
- **ECS M&O Manager or designee (chairs Telecon)**
- **DAAC representatives**
- **SEO engineering team leads (one may be designated the TT Telecon/FRB chairperson)**
- **ECS ILS engineering support representatives**
- **ECS engineering team leads and operations representatives (via telecon)**
- **ECS M&O support staff**
- **ECS development organization representatives**
- **SCF(s) representatives (in person or via telecon)**

TT Telecon and FRB (Cont.): TT Agenda/Discussion



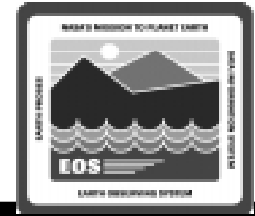
- **Review and prioritize each TT opened at each center**
- **Review and re-prioritize older TTs (as required)**
- **Assign TT work-off responsibility to one organization**
- **Review distribution of TTs by organization, priority and age**
- **Discuss TT issues with development organizations**

TT Telecon and FRB (Cont.)



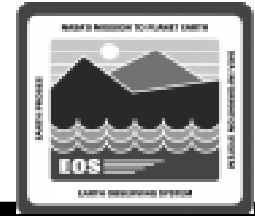
- **Agenda items may be supplemented or replaced with hardcopy or softcopy reports**
- **Material from the meeting is distributed within each ECS organization and to customer and user organizations as required**

TT Telecon and FRB (Cont.)



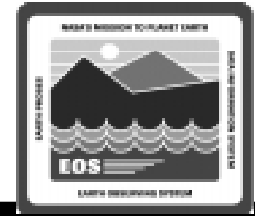
- **FRB obtains all necessary assistance to ensure thorough analysis of the problem**
 - may obtain assistance from system hardware suppliers
 - coordinates investigations and remedial actions with the appropriate project personnel from the National Aeronautics and Space Administration (NASA)
 - assures proper documentation of investigations and remedial actions
 - ensures that configuration changes (if any) are made in accordance with the configuration management procedures

TT Telecon and FRB (Cont.)



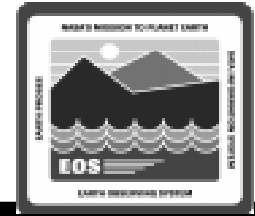
- **Conditions to be verified before a malfunction report may be closed out:**
 - remedial and preventive actions completed on item
 - preventive design changes completed and verified
 - effective preventive actions established to prevent problems with other affected items

TT Telecon and FRB (Cont.)



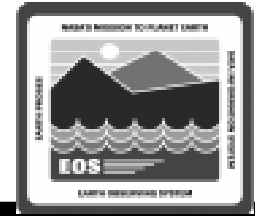
- Both FRB (first) and NASA must officially approve each Category-1 problem resolution submitted to the FRB to close it out
- Red Flag reports
 - are highlighted at Government assurance reviews
 - must have their resolution approved by both:
 - contractor project manager
 - government EOS Project Manager

Making Emergency Fixes



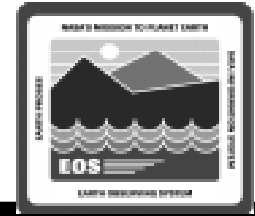
- **Procedure varies**
 - nature of the problem
 - from ECS center to ECS center
- **Issues for providing a common framework for emergency responses to crisis-level situations:**
 - contingency plans
 - points of contact
 - general guidelines
- **General process not specific procedure**
 - model process: Hardware Emergency Change Scenario (604-CD-003-002)

Making Emergency Fixes (Cont.): Hardware Emergency Change



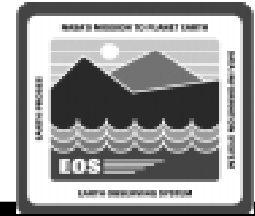
- **Operator detects problem with ATL on Saturday evening; submits a TT**
- **System administrator confirms problem; notifies site maintenance engineer**
- **Maintenance engineer confirms problem**
- **Maintenance engineer reports problem to OEM**
- **OEM maintenance representative arrives, verifies symptoms, diagnoses faulty controller card; only spare available is of a later version**

Making Emergency Fixes (Cont.): Hardware Emergency Change



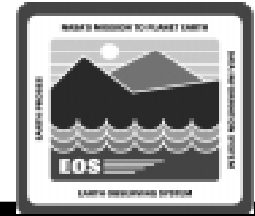
- **Maintenance engineer reports situation to operations crew chief**
- **Operations crew chief calls DAAC manager at home to report situation; DAAC manager approves board replacement with newer version contingent on acceptable testing results**
- **OEM maintenance representative installs replacement board**
- **Sustaining engineer tests new board; brings ATL back on line**

Making Emergency Fixes (Cont.): Hardware Emergency Change



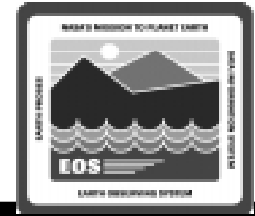
- **Sustaining engineer generates CCR to document the configuration change**
- **Maintenance engineer records board replacement on TT, referencing CCR**
- **Maintenance engineer closes TT**
- **Maintenance engineer updates TT system property record with data on new board**
- **Sustaining engineer records installation in CCR; routes CCR to CM administrator**

Making Emergency Fixes (Cont.): Hardware Emergency Change



- **CM administrator decides whether to refer CCR to CCB**
- **CM administrator updates Baseline Manager**
- **ECS SEO reviews CCR to determine effects on ECS system and other sites**
- **ESDIS CCB receives copy of CCR for review and concurrence**
- **CM administrator closes CCR when CCB has ratified the change**

Help Desk



- **Established at EDF as single point of contact to provide quick response for critical ECS operational problems**
 - assist DAAC staffs with critical operational problems in the minimum time possible
 - document all critical operational problems and make information available via the SMC home page
 - train DAAC staffs for greater self-sufficiency
 - perform weekly trend analyses on trouble reports and report the results to EDF management
 - write Severity 1 non-conformance reports where fixes or work-arounds are not possible and the reported problem has not yet been documented
- **Access: 1-800-ECS-DATA (1-800-327-3282)**